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AN INTEGRATED APPROACH TO THE EVALUATION OF CONSTRUCTION NEEDS OF THE AFRICAN REGION

SUMMARY

African countries have promoted construction activities in response to their perceived national economic and social needs since independence. However, more than twenty years after independence, the region has achieved little growth but has rather been trapped in a web of economic and social crisis - hunger, unemployment, stagnant industrial growth and a staggering foreign debt position.

ECA responded to the said position by assisting in the preparation of the Lagos Plan of Action (LPA) which emphasizes the development of key sectors of the region based upon collective self-reliance. Still five years after the LPA, little progress has been achieved. This failure has prompted the ECA (in collaboration with the OAU) to prepare Africa's Priority Programme for Economic Recovery (APPER).

It is in response to the above two programmes that the building construction needs of the region are appraised in this paper. It is noted that the primary function of the construction sector is to provide the infrastructure needs of all other sectors. However, the failure to recognize this pivotal role of the sector has led to the lack of integration, an absence of capacity evaluation and the inability of the construction sector to provide the infrastructure needs envisaged under the LPA.

The paper notes that unless the other major sectors such as agriculture, industry, transport and communication closely integrate their infrastructure needs within the activities of the construction sector, the projected growth rates envisaged under the LPA and the APPER cannot be attained. Finally, the paper identifies certain areas where assistance is required to improve the productivity of the sector in order to meet the infrastructure needs of the LPA and the APPER.

INTRODUCTION

The construction sector and the LPA

1. For individual African countries, an approach to evaluating construction needs is to examine the effective contribution of the sector to national economic and social development objectives. On the regional scale however, the only realistic approach would be to refer to the pivotal role that the construction sector would play in realizing the objectives of the LPA. By far, the LPA constitutes the most significant approach towards development objectives and strategies at the regional level, acceptable to all heads of State and Government of the ECA.

2. Partitioned into some 50 States - some of which are hardly economically viable entities, each member State has pursued an independent development objective, often reflecting piece-meal solutions to pressing problems of a particular period. Thus since independence in the 1960s, Africa can point to only little significant growth rate, or any satisfactory index of general well being.

3. It is in response to the above failure, that the LPA was prepared based primarily on collective self-reliance. Among others, its main emphasis were on the development of agriculture, industry, transport and communications. Although not specifically stated, none of the above sectors can take-off without a significant investment in basic infrastructure to be provided by the construction sector.

4. Under agriculture, the construction of appropriate storage, processing and similar other facilities will be essential to minimize post harvest losses and promote food security. On a broader basis, the development of irrigation channels, flood control, drainage, and physical infrastructures including dams, bridges, and feeder roads are among the immediate contributions that the construction sector can make to increase agricultural output.

5. The proposed scope of industrial development is no less relevant. Under the medium-term objectives of the Industrial Development Decade for Africa as embodied in the LPA, the production in sufficient quantities of building materials for the construction of urban and rural houses, was spelt out for the sector. And yet for the other areas of industrial activity, the construction sector has to provide, at least, factory buildings for all proposed industrial establishments.

6. In April 1980, African Heads of State accepted the Mar del Plata Action Plan which culminated in the United Nations General Assembly resolution 35/18 of November 1980, proclaiming the period 1981-1990 as the International Drinking Water Supply and Sanitation Decade. At the time of launching the Decade, it was estimated that as many as 414 million people in Africa will require access to good drinking water, while some 472 million should be provided with adequate sanitation. The success or failure of the Decade depends, to an appreciable extent, upon the performance of the construction sector.

7. The LPA also accepts the goals and objectives of the United Nations Transport and Communications Decade for Africa, phase one of which involves some 450 transport and 100 communications projects estimated at $8,342.19 thousand and $8,855.94 thousand respectively. Much of these involve construction.

8. Similarly, all other areas of development envisaged under the LPA will involve construction in one form or the other. So relevant is construction to all activities envisaged under the preliminary phase of the plan that the construction sector could be described as the backbone of the LPA. The major question which remains unanswered is how successful has the LPA been to date and how effective was the construction sector in achieving the said success or failure.

9. An OAU activity report on the implementation of the LPA and the Final Act of Lagos aptly answers the question as follows: "Five years after the adoption of the LPA, and the Final Act of Lagos, very little progress has been achieved in the implementation of the Plan and the ACT". The agricultural sector could not achieve the projected growth rate of 4 per cent p.a.; it was only 1.7 per cent against annual population growth of 2.8 per cent. Most industries operated under 50 per cent of their installed capacity, while others have had to close down. Poor infrastructure was identified as one of the major causes of failure. As a result, the region has continued to import both food grains and manufactured consumer goods under foreign loan agreements. No wonder then that the region's external debt is estimated to be about $170 billion by 1985. Three years after launching the decade for drinking water and sanitation, only 32 million people had access to good drinking water and 12 million were provided with adequate sanitation.

10. It is in response to the above failures that the APPER was prepared for the five year period ending 1990. Under APPER, the rehabilitation of the agricultural sector was given priority attention. What is interesting is that the same construction activities that were envisaged under the LPA, were noted as being crucial under the APPER also. In addition, the emphasis of the APPER on food and agriculture does not in any way understate the important roles that industry, transport, communication, water and sanitation have to play in the overall development of the region. Indeed, the chronic shortage of resources indicat. that co-ordinated actions in all the sectors supporting agricultural and other productions should be established.

11. It is in line with the above that the construction needs of the African region should be evaluated. Essentially, the construction sector should be considered in its proper perspective - not only as providing shelter for the region's populations but more important as providing the infrastructure for the take-off stage of the other sectors. While infrastructure needs for both the LPA and the APPER were well identified, their provision has neither been quantified nor linked with the construction capacity of the region. On the contrary, if it was assumed that the requisite technology, skills, equipment and machinery for providing the necessary infrastructures could be imported, then the planning process has sadly lost sight of the region's foreign debt position. The fact thus remains that the objectives of neither the LPA nor the APPER would be realized without a significant contribution from the construction sector.

12. There is no sector of the national economy which does not depend upon the construction sector for its development. Its scope covers the provision of roads, railways, harbours and airports for the movement of peoples and good; factory buildings for manufacturing industries; storage silos and irrigation channels for agriculture; drainage channels for foul water disposal, pipe lines for domestic and industrial water supply and shelter for human beings. Both the LPA and the APPER

have rightly identified the above needs which are pertinent for the take-off of the various sectors. However, further quantification of the needs to match construction capacities does not seem to have received equal attention. It is no wonder that the emphasis of implementation was on collective self-reliance. Unfortunately, it is at the very national and sub-regional levels that the necessary evaluation of implementation capacities had persistently been lacking. The question is whether Africa has the construction capacity to meet the infrastructure needs envisaged under the LPA and the APPER.

SCOPE OF THE CONSTRUCTION SECTOR

13. A major consideration for the success of both the LPA and the APPER is whether the identified infrastructure requirements would be provided within the planned period. The above consideration calls for an evaluation of the construction needs of the African region. The question is whether the construction sector of the region is well structured and sufficiently equipped to provide the required infrastructure. Such an evaluation should cover the organizational structure, construction technology, skills, productivity, and costs that currently characterize the construction industry of the region.

Characteristics

14. The construction industry of the African region demonstrates certain major characteristics which bear directly on the productivity of the sector, its capacity to meet the challenges envisaged in the LPA and the APPER as well as the critical economic crisis position of the region. Among others, the size of firms, foreign participation, import dependence, technology and skills are of importance.

Size of firms

15. Perhaps the most important characteristics of the construction sector of the African region is the predominance of small scale contractors (SC) who, by virtue of their equipment, skills and financial position cannot be considered suitable for implementing the types of infrastructure projects envisaged under both the LPA and the APPER. Usually equipped with one tipper truck and financial standing of about US$ 10,000, SC constitute not less than 50 per cent of all registered construction companies in the region. The said percentage composition is not unusual noting the fact that even in a highly industrialized country like the German Democratic Republic and also in a developing country like Brazil, about 60 per cent of all registered contractors are SC.

16. The problem with the African region is that while such firms would be very suitable for the provision of low-cost shelter for the majority of the region's population, their productivity and quality of work are low.

Foreign participation

17. Another important feature of the construction industry of the region is the significant participation of foreign firms. In Ghana, several foreign construction companies dominate civil engineering projects. In Zambia, almost 65 per cent of all registered contractors are foreign. Kenya represents a different picture where a large number of medium-sized Asian firms handle works ranging from minor maintenance jobs to multi-million dollar projects. And in Nigeria, the construction of the new Federal Capital, Abuja, is being undertaken by French firms, while another

foreign company has built houses estimated at $175 million at Harri.

18. Considering the critical economic position of the region and the fact that Africa's external debt is almost $170 billion, one wonders whether the use of foreign construction companies for the execution of even simple housing projects is worth the cost to the national economy.

Import dependence

19. It is not surprising (with the domination of foreign firms) therefore, that the construction sector depends heavily upon imported inputs - building materials, machinery, equipment and skills. At least in 1970, $1,275 millions worth of building materials were imported into the region; while in 1980, about $87,800,000 was spent to import some 2,195,000 tonnes of clinker into the West African subregion alone. The costs of imported iron/steel, machinery and equipment for the same sector are staggering. But while all the costs are noted for the construction sector, the fact remains that the items were used for all sectors of the economy and emphasizes the fact that without an adequate evaluation of the construction sector, the objectives of the LPA and the APPER would be realized at increased foreign debts.

Technology

20. It may be a mistake to generalize what could constitute an appropriate construction technology for the implementation of the variety of projects envisaged under the LPA and the APPER. Apart from low-cost shelter requirements for the region's population, most of the operation involve civil engineering undertakings. Unfortunately, it is exactly in the latter category that indigenous contractors are lacking.

21. The effect is that it has often been difficult to influence the type of construction technology applied to most civil engineering, road and special building projects (such as storage silos and factory buildings) that are particularly required for the take-off phases of the LPA and the APPER. However, one begins to wonder what the region is up to when governments award even simple housing projects to foreign firms.

22. Even for some capital intensive projects, it is observed that in some countries, the foreign firms depend extensively upon domestic resources. It would appear therefore, that a few indigenous construction firms could stand up to the challenge once they have adequate machinery and equipment.

Skills and productivity

23. However, difficulties in recruiting skilled labour for the construction sector exist in most countries of the region. This has reflected adversely on general productivity in the sector. It is noted that there is the tendency to employ - in absolute terms - a large number of workers per monetary unit invested. The construction sector thus registers one of the lowest levels of labour productivity in the African region. Particularly regarding low productivity, the following are among the numerous contributing factors:

- inadequate training and poor quality of work;
- the use of poor and obsolete machinery/equipment;
- poorly maintained plants;
- poor and inefficient supervision;
- frequent shortages of key construction materials;
- failure to apply management principles like proper site layout, material scheduling and control system;
- high incidence of material wastages;
- high degree of pilfering by workers.

24. It would appear from the above that it is not beyond the competence of local construction firms to increase productivity, since the above drawbacks could be readily remedied.

Construction costs and project completion

25. Another characteristics of the construction industry of the region which may affect the successful implementation of LPA and the APPER relates to the completion of projects on schedule as well as the resulting costs. It is noted that most projects are not completed on time and when they are eventually completed, cost overruns are enormous. In several African countries, there are large numbers of uncompleted projects while similar new ones are being initiated. If such practices are extended to projects envisaged under the LPA and the APPER, one would be sure of further failures in the future.

Informal sector operations

26. A final characteristics of the construction sector of the African region relates to the contribution made by informal operators. These include unregistered small scale builders who handle operations on part-time basis. It is an area where entry and exit are not restricted; they dominate shelter construction in rural areas, and in some countries such as Ethiopia, they account for the provision of low-cost shelter and waste disposal facilities in urban settlements. It may appear that from their contribution to date, the informal sector may be effective in meeting rural housing needs envisaged under the LPA although with some assitance to upgrade their performance.

Orientation to the objectives of the LPA and APPER

27. The foregoing overview of the construction sector of the African region enables some broad observations to be made with regards to the effectiveness of the sector in meeting the objectives of the LPA and the APPER:

- The preliminary phases of the LPA (as envisaged under agriculture, food, IDDA, Transport and Communications Decade, Drinking Water Supply and Sanitation Decade) cannot be implemented without a significant contribution from the construction sector;

- It appears that the implementation of programmes envisaged under the various "Decades" have been pursued on individual sector levels; under such conditions, the failure to provide the necessary infrastructure (by the construction sector) would constitute major bottlenecks to progress;

- The present composition of the construction industry implies that the sector would continue to be a main drain on scanty foreign exchange earnings of several African countries - noting the huge expenditures on material imports and profit repartriations;

- Small-scale contractors and informal operators are most likely to meet the region's low-cost shelter needs for the future.

28. From the above observations, what remains to be done is a meaningful orientation of the construction sector to the objectives of the LPA and the APPER. This implies an assessment of the region's construction capacity on the one hand and an obligation on the part of all other sectors to plan their programmes jointly with the construction sector.

29. The construction sector has a key role to play in achieving the objectives of the LPA and the APPER. The sector may require some restructuring to improve its productivity on the one hand, and a re-orientation to directly meet the requirements of the LPA and the APPER on the other. Unless these are done, the sector could constitute a major bottleneck to the region's aspirations for development. The following conclusions could therefore be made:

- Several civil engineering and special building projects envisaged under the LPA and the APPER could be implemented by foreign firms operating in the region but this would spell the increase in the foreign debt position of Africa. The solution may be for national governments to strengthen the financial, equipment, machinery and skills, position of local firms so that the latter could meet the construction needs;

- With existing low level of productivity, it may be difficult to complete most projects on time; delays and cost overruns should be expected. Efforts to improve productivity are urgently called for;

- Technology imports particularly through foreign construction companies seem to have had little impact on the performance of local firms. Immediate steps are needed to enable local firms to learn from the experiences of foreign firms;

- Small-scale contractors (and informal operators) could implement all of the region's low-cost shelter requirements. However, there is the need for governments to become clients to these firms.

PROSPECTS FOR INCREASING THE CONTRIBUTION OF THE CONSTRUCTION SECTOR TO THE LPA AND THE APPER

30. The LPA and the APPER are conscious efforts towards the development of the African region. However, the staggering external debt position of the region further emphasizes the need for collective self-reliance stressed in the LPA; the African region should therefore, rely more on its domestic construction capacity to provide the infrastructure requirements envisaged under the plan. Some areas through which the contribution from the construction sector could be increased are discussed hereunder.

Analyzing and co-ordinating sectoral requirements

31. Attempts at detailed and overly sophisticated forecasting of infrastructure needs have often proved ellusive because of inadequate data and limited understanding of how sectoral investments and outputs are linked. Analytical efforts should therefore concentrate on designing investment programmes in key infrastructure sectors and on checking the consistency of these programmes with the likely requirements of the productive sectors. Governments therefore need to be selective; they can effectively address only the most important public investment issues at any one time.

32. In order to achieve the above, emphasis should be placed on co-ordination and consultation - between government departments as well as between government and the private sector. Such co-ordination efforts would require some element of flexibility in programming methodology; with the existing resources position, no individual sector can expect to obtain all of its infrastructural requirements. Governments therefore need to develop the capacity to respond quickly to changing situations by modifying their policies and programmes. The construction sector would be effective in implementing a fewer number of well co-ordinated projects rather than a host of projects with inadequate resource allocation.

Overprogramming

33. Perhaps a word of caution at this juncture with regard to overprogramming could help to focus the attention of those involved in realistic programming. Care should be taken that investment-plans are not too ambitious, given the available resources. There is a widespread tendency to underestimate the cost of implementing specific infrastructure projects within a programming period. However, when too many projects are started at the same time, available skills are dispersed, project implementation is retarded, resulting into cost overruns and an increase in the number of uncompleted projects. Effective programming should always maintain a balance between the volume of projects, time constraints and construction capacity. New projects should not be started at the expense of inadequate funding for on-going projects. Given the incremental costs and benefits, projects already under way should have a high priority for funding, as should be the operation and maintenance of completed projects.

Technology and innovative design concepts

34. Another area which holds prospects for increasing the contribution to the LPA and the APPER relates to construction technology and innovative design concepts. Simply defined, construction technology involves the combined utilization of materials, equipment/tools and skills to produce a given good. Construction technology is quite flexible with regards to the production of several goods either through varying the capital - labour mix or substituting one material for another.

35. Usually, however, most designers in the African region have shown little innovation in their design concepts. For example, food storage silos need not be designed always in cement concrete or aluminium. There are comparatively cheaper and equally effective silos designed in wood; and yet despite the abundant wood resources of the region, only expensive designs utilizing concrete or aluminium are popular. Similar alternative designs and technologies abound in all areas of infrastructure provision.

36. In view of the external debt position of the region and the need for collective 'self-reliance', the contributions of the construction sector to the LPA and the APPER would be increased with innovations in design concept, and the application of the appropriate technology to utilize more of the region's natural resources.

Teaming-up with foreign companies

37. As noted earlier the prime grade categories of contractors in the region are foreign companies. Particularly for civil engineering, road and special building works, the advantages lie in the experience, machinery and supervisory skills that the foreign companies possess. An area to improve the productivity of local firms so that they could increase their contribution to the LPA and the APPER is to encourage teaming up of foreign and local companies. Steps in the latter direction have already been initiated in some countries, such as Ethiopia, Kenya and Ghana with very encouraging results.

Training and productivity

38. It was also mentioned earlier that the productivity of most of the local construction companies is low; not only is the output per man/hour low but also the quality of work sometimes leaves much to be desired. The observation is that most of the companies may require some form of training to be able to contribute effectively towards the realization of the objectives of the LPA and the APPER. In particular, most local contractors would require training in tendering, site management, accounting, materials scheduling and control systems.

39. The mere formation of a construction company is not enough to increase productivity. In most African countries, construction is regarded as business so that financial standing and equipment position are utilized to grade the company. The result is that trained personnel are usually hired by others who have no knowledge of the entire construction process. Frustrated by low wages, and poor relationships with owners of the company, site management and quality control are relaxed, the incidence of materials wastage increases and pilfering continues unquestioned. It is no wonder then that foreign firms operating in the African region often attract the most qualified skills. There is no way the construction sector can meet the challenges of the LPA and the APPER without increasing productivity. Training is inevitable to the latter.

Areas of public support

40. Finally, the construction sector could contribute to realizing the objectives of the LPA and the APPER if given adequate public support. Public support would be needed in the areas of finance, material distribution, plant pool, client to local firms and encouragement of mergers.

41. Finance constitutes one of the major inputs into construction operation. Its universal need to procure machinery, equipment, tools and trucks, to build workshops, purchase building materials and hire skills has restricted both entry into the sector as well as an upward movement of small scale operators to higher categories of contractor grades. The effect is that throughout the African region, the higher categories of the construction industry are dominated by foreign firms who had a favourable financial support from their home countries.

42. Although most governments have established construction banks, it should be pointed out that these banks do not possess unlimited supplies of loanable funds; also they are subjected to the same lending controls from central banks as relates to commercial banks. The result is that financial supply has never been adequate to the construction sector and this could constitute a major bottleneck to the implementation of infrastructure programmes envisaged under the LPA and the APPER.

43. Public support will be effective in circumventing the financial hurdles through:

- direct support for the procurement of machinery and plants;
- guaranteeing bank loans to limited sums in respect of specific LPA and APPER projects;
  reducing interest rates charged on construction loan;
- relaxing some of the monetary control policies of the central banks in as much as LPA and APPER projects are involved.

Distribution of materials

44. Building materials production and distribution facilities in the African region are invariably concentrated in a few major settlements. Particularly for the construction of infrastructure in support of food and agriculture, water, transport and communications, limited distribution facilities may not only tend to increase project costs but more so delay the timely completion of projects. The situation is aggravated in those African countries which experience frequent shortages of key building materials.

45. Public support would again be required in the procurement and effective distribution of essential building materials to serve construction needs of the LPA and the APPER. This may require the establishment of materials depots in various regions as against the present practice of concentrating in a few capital cities.

Plant pools

46. Another area where the public can provide an immediate support to the construction sector in order to be able to provide the infrastructure needs of the LPA and the APPER is in the establishment of plant pools. Construction machinery and plants constitute very expensive capital goods. In most countries there are several registered construction companies who own no operative plants and machinery. And even for firms which manage to acquire some, the equipments are usually underutilized for most parts of the year.

47. The combined effect of under utilization on one hand and shortage on the other, calls for an innovative approach to the procurement and utilization of construction machinery and plants. Public support is required to establish plant pools which could provide the needed machinery for common use.

Client to local firms

48. It was noted earlier that in some African countries, even simple building projects are awarded to foreign firms. Unfortunately the same governments are unable to provide foreign exchange to local contractors to import machinery - they would however afford to pay for work done in foreign currency. Public support may be necessary in this area also; the governments should award contracts under the LPA and APPER to local firms and make part payments in form of machinery and equipment if so required. Such supportive measures would be useful in improving the operational capacity of local firms.

Teaming-up

49. A final area of public support will be for governments to insist that for any contract to be awarded to a foreign firm under the LPA and APPER, a local firm should be involved. Such public support measures will serve, among others, three purposes:

- it will enable local firms to learn from the experiences of the foreign contractors;
- it will keep local firms in business as against the existing on-and-off nature of most construction operations; and
- it will reduce the amount of money that would be repartriated in profits by foreign firms.

50. The construction sector of the African region has all prospects to contribute to the success of LPA and the APPER. However, construction requirements under both programmes have been considered as any other infrastructure needs for individual sectors. It is necessary for African governments to realize that construction is a specialized sector and that operations become more complex when infrastructure projects such as roads, dams, silos and special buildings are involved. Failures should therefore, be expected when sectors specializing in completely different fields begin to contract civil engineering projects. It is therefore, necessary for African governments to institute certain measures that would increase the contribution of the construction sector to the LPA and the APPER. Some of these measures include:

- integrating infrastructure requirements of the various sectors with the overall construction programme of the country;
- innovative design concepts and appropriate technology should be introduced to minimize costs and increase productivity;
- governments should encourage teaming up of local and foreign construction companies;
- skills training should be given priority attention as a means to increase productivity;
- public support should be given to the construction sector in areas of finance, distribution of essential building materials and the establishment of plant pools. Governments should also act as client to local firms.

It is hoped that with the said measures, the construction sector of the region will be in the position to meet the construction needs of the LPA and the APPER.

OBSERVATIONS AND RECOMMENDATIONS

Observations

51. A close examination of the issues discussed points, among others, to four main factors which may require the attention of most governments in order to improve upon the performance of the construction sector in general, and its contribution to the LPA and the APPER in particular. These include the following:

. Most African countries have sufficient numbers of small scale construction companies which could provide all the shelter requirements of the regions. However, the poor equipments, financial and skills position of these companies have adversely affected their productivity.

- Even after independence, foreign construction companies continue to implement major infrastructure and special building projects in most countries. It is interesting to note that under most of these contracts, African governments approve part payments in foreign currency to enable the foreign firms to procure machinery and equipments for the projects; there is the other aspect that in most countries, most of the supervisory skills are locally recruited. The question therefore, remains why the same governments cannot offer similar supports to local firms.

- The construction sector of the African region largely depends upon imported machinery, equipments and building materials. At least for the latter, governments should examine sources of local substitutes in order to reduce imports.

- There is inadequate co-ordinations among the various sectors regarding the provision of infrastructure with the resultant duplication of projects. With inadequate resources, several new projects are initiated at the expense of on-going ones. This appears to be the major cause of cost overruns and numerous uncompleted projects known in several countries.

Recommendations

52. The following recommendations are therefore, provided for the consideration of African Governments:

- The provision of adequate infrastructure as entailed under the LPA would involve huge financial outlays. There is therefore, the need for effective co-ordination among the various sectors with the view to minimize duplication and establishing priorities. An inter-ministerial mechanism should therefore, be developed for purposes of effective co-ordination, the establishment of priorities and capacity evaluation.

- African governments should encourage local firms to gain from the experiences of foreign companies operating in their countries. Measures should therefore, be introduced to promote teaming-up of local firms with foreign ones to implement common projects.

- African governments should adopt supportive measures that could improve upon the productivity of local construction firms. Public support will be effective in areas of finance, materials distribution, establishment of plant pools, and also as client to local firms.